

## Electronic Nose

Arson kills more than 1,000 people a year in the United States, causes injuries to thousands more and costs the nation some \$5 billion annually. Law enforcement agencies, firefighters and insurance companies are increasing their efforts to identify and prosecute arsonists. An essential first step is determining the cause of the fire. An aerospace spinoff product is proving helpful in post-fire detection of flammable liquid "accelerants"—such as gasoline, benzene and many other combustibles—used by arsonists to speed up fire spread. The device employs the same electronic circuitry as a signal conditioning system originally developed for Langley Research Center.

Shown in use at a fire scene is the Electronic Nose<sup>®</sup> vapor and gas detector manufactured by Grace Industries, Inc., Transfer, Pennsylvania. Capable of sensing the presence of accelerants several days after a fire, the device is powered by a rechargeable battery and is so simple to operate that users need no special training. The investigator holds the Electronic Nose about an inch from the suspect material. If an accelerant is present, the device will emit a beeping sound and trigger a flashing light; the faster the beep rate, the more volatile the accelerant. Extremely sensitive, the Electronic Nose can detect minute traces of accelerants, for example, a hydrocarbon gas concentration of less than 50 parts per million. The unit saves investigators time and expense by providing speedy detection of physical evidence for use in court.

The Electronic Nose is widely used by police and fire departments, insurance claims departments and federal/state agencies. It is used in criminal justice courses at the University of Texas, Austin, Texas, and in arson seminars conducted by Dr. Richard W. Henderson (shown in photo) at Francis Marion College, Florence, South Carolina. The device is also useful in other applications, such as detecting hazardous fumes,

locating gas spills that have seeped into sewer systems, and detecting gas leaks in refineries and on oil drilling rigs; several major companies are using it for the latter purpose. Grace Industries is producing about 1,000 units a year and plans introduction this year of a line of business and residential security systems based on the same electronic circuitry.

<sup>®</sup> Electronic Nose is a registered trademark of Grace Industries, Inc.

